901-99 "The 60-Minutes Myocardial Infarction Project": Lower Rate of Diagnostic ECG on Admission, Shorter Prehospital Delay and Increased Door-to-Needle-Time in Patients with Acute Reinfarction

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Purpose: It is unknown if patients with myocardial reinfarction have a different rate of diagnostic ECG changes compared to patients with first myocardial infarction or if they have a shorter prehospital delay. Besides the evaluation of these questions, differences in time to treatment and intrahospital mortality in both groups are studied.

Methods: "The 60-Minutes Myocardial Infarction Project" is a multicenter nationwide registry, including 154 hospitals in Germany. During an 8-month period 4710 consecutive patients with proven transmural AMI were enrolled and ECG on admission, prehospital delay (PHD), door-to-needle-time (DNT), and lysis rate (LR) were registered.

Results:

	Reinfarction	First Myocardial Infarction
number of patients	888	3723
diagnostic ECG for AMI	57%	72%
bundle branch block	15%	9%
prehospital delay	150 min	180 min
door-to-needle-time	35 min	30 min
mortality within 48 h	11%	7%
intrahospital mortality	25%	17%

The two groups do not differ in age, gender and lysis rate (48 vs. 50%).

Conclusions: 1.) The rate of diagnostic ECG on admission is lower for reinfarctions, partly due to a higher incidence of bundle branch block.

2.) Door-to-needle-time is slightly increased as ECG diagnosis is impaired.

3.) Patients with reinfarction appear half an hour earlier in the hospital after the onset of symptoms compared to patients with first myocardial infarction.

4.) Early and total intrahospital mortality are higher with reinfarctions.

NUCLEAR CARDIOLOGY — CONVENTIONAL IMAGING

901-100 Prognostic Value of Technetium-99m Sestamibi Myocardial Tomography One Month After Successful Angioplasty: Comparison to Peri-procedural Angiographic and Intracoronary Doppler Flow Velocity Parameters

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The prognostic value of post-PTCA stress technetium-99m sestamibi (MIBI) scintigraphy relative to peri-procedural coronary angiographic and flow parameters has not been established following successful percutaneous transluminal coronary angioplasty (PTCA). To this end, 34 consecutive pts aged 57 ± 14 yrs were followed for 13 ± 10 months after successful single-vessel PTCA (mean % diameter stenosis [DS] from 78 ± 15% to 24 ± 11%; $p < 0.001$) for cardiac events (death = 1, MI = 1, CABG = 2, repeat PTCA = 6). Basal intracoronary 0.018" Doppler flow wire distal/proximal average peak velocity ratio (mean d/p APV ratio = 1.0 ± 0.7) and hyperemic distal coronary flow velocity reserve (mean CFR = 1.7 ± 0.6) were obtained immediately after PTCA. Same-day rest-stress MIBI tomograms performed 4.7 ± 3.7 weeks after PTCA were blindly interpreted to quantify total (1.6 ± 2.5), fixed (0.9 ± 1.7) and reversible (0.8 ± 1.5) defects per PTCA vessel perfusion bed. Multivariate Cox regression modeling determined the relative risk (RR) of cardiac events:

	Event Rate	RR (95% CI)	Chi Square	p value
Post-PTCA %DS > 30%	15%	0.3 (0.1–1.7)	1.94	0.16
PTCA zone rev. MIBI	50%	5.5 (1.0–10)	2.93	0.08
Distal CFR <2.0	60%	8.3 (2.5–17.1)	2.56	0.07
d/p APV ratio <1	53%	6.2 (1.2–10.4)	3.94	0.04
Rev. MIBI defect + ratio <1	60%	2.3 (1.5–3.6)	4.22	0.03

We conclude that post-PTCA cardiac events are predicted by residual abnormalities of coronary flow and stress MIBI myocardial perfusion. Combining these variables can enhance their predictive value for adverse post-PTCA outcomes, which frequently occur despite initial angiographic "success".

901-101 Evaluating the Effectiveness of a Nuclear Cardiology Training Program: Comparison of Trainees with Faculty

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To evaluate the effectiveness of structured nuclear cardiology training, the reproducibility and accuracy of image interpretation by nuclear cardiology faculty and senior cardiology fellows were compared. The reproducibility and accuracy of 3 faculty and 3 trainees with 6 months training following Nuclear Regulatory Commission/American College of Cardiology guidelines were assessed using 138 exercise Tc-99m Sestamibi SPECT studies. Studies were randomly selected and included patients with <5% likelihood of CAD as well as patients with angiographically demonstrated single and multivessel disease. Studies were interpreted twice by each reader without knowledge of clinical or exercise data. Each reader classified perfusion as normal (N) or abnormal (AB). AB perfusion was further classified as fixed (F) or ischemic (I). Reproducibility was compared with respect to first order (N vs AB) and second order (N vs F vs I) intra and inter observer agreement and assessed using percent agreement (%) and Cohen's kappa. Accuracy was assessed using sensitivity and normalcy rate and compared using percent agreement and Cohen's kappa.

		Trainees		Faculty	
		%	kappa	%	kappa
Reproducibility					
First order	intra:	89	0.78	92	0.82
	inter:	80	0.59	86	0.71*
Second order	intra:	81	0.66	87	0.74*
	inter:	69	0.46	82	0.64*
Accuracy					
Sensitivity		82		87	
Normalcy Rate		85		89	
% agreement/kappa		83	0.63	87	0.73*

*$p < 0.05$ compared with trainees

Trainees had high reproducibility and accuracy, comparing favorably with faculty in all categories. Faculty had significantly higher results in several categories.

Conclusion: Structured training in nuclear cardiology following Nuclear Regulatory Commission/American College of Cardiology guidelines during clinical cardiology fellowship is very effective, resulting in high reproducibility and accuracy. Interpretive skills can be expected to further improve with experience.

901-102 Atherosclerotic Plaques Imaged by Tc-99m-Labeled Synthetic Peptide

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I-123 SP-4, a synthetic oligopeptide fragment of apolipoprotein B, identifies aortic atherosclerosis in a hyperlipidemic rabbit model by external gamma camera imaging. Because Tc-99m is preferable to I-123 for imaging, we have studied 3 Tc-99m-labeled SP-4-derived peptides, each coinjected with I-125 SP-4 into normal (NL) or cholesterol-fed (CF) New Zealand White Rabbits, sacrificed at 15–30 min (6 NL; 6 CF) or 2 hr (11 NL;12 CF) later. Aortas in CF rabbits invariably revealed high atherosclerotic lesion density, while atherosclerotic lesions were absent from NL rabbit aortas. After sacrifice, the aorta was excised and divided into upper, middle and lower segments and percent injected dose per gram (%ID/gm) was determined. At 30 min NL and CF did not differ, but at 2 hrs %ID/gm values were as follows:

Aorta	Time	P352	P302	P380	SP-4
Upper	NL 2 hr	0.00573	0.00208	0.00332	0.00088
	CF 2 hr	0.00534	0.00238	0.00748	0.00296*
Middle	NL 2 hr	0.00359	0.00194	0.00273	0.00078
	CF 2 hr	0.00459	0.00212	0.00722*	0.00203*‡
Lower	NL 2 hr	0.00367	0.00162	0.00188	0.00061
	CF 2 hr	0.00300	0.00195	0.00806*	0.00209*†

*$p < 0.05$ vs NL, †$p < 0.02$ vs P380, ‡$p < 0.008$ vs P380

Tc-99m P380 showed greater absolute uptake in plaque than SP-4, and relatively similar CF-to-NL ratios. We conclude that P380 shows particular affinity for the atherosclerotic aorta, comparable to that apparent with I-123 SP-4. Given the favorable imaging characteristics of ^{99m}Tc vs ^{123}I, P380 holds particular promise for clinical imaging.